DOCUMENT RESUME

ED 169 961 JC 790 246

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TITLE Educational Testing and Learning Clinic Year-End Statistical Report. Third Annual Report, 1977-1978.
INSTITUTION Orange Coast Coll., Costa Mesa, Calif.
PUB DATE [78]
NOTE 33p.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; Auditory Perception; Community Colleges; Diagnostic Teaching; Diagnostic Tests; Individualized Instruction; Intelligence Quotient; *Junior Colleges; *Learning Difficulties; *Learning Laboratories; Memory; Remedial Arithmetic; *Remedial Programs; Remedial Reading; *Student Testing

ABSTRACT

The "open-entry, open-exit" Educational Testing and Learning Clinic (ETLC) at Orange Coast College uses an extensive battery of tests and individualized remedial programs to identify and correct learning difficulties. The full mean score of the ETLC students on the Wechsler Adult Intelligence Scale was about seven points below the norm, but within normal limits. Reading tests revealed that the ETLC students were functionally literate, with an average reading level between middle fifth and low sixth grade. Spelling and arithmetic tests indicated that in these areas ETLC students were functioning at grade equivalents of 4.4 and 5.5, respectively. In addition, these students had auditory processing, and auditory and visual memory problems that were no doubt related to academic deficiencies. After slightly over five hours of remediation per week for approximately five instructional months statistically significant gains were made in reading (the ETLC groups' word recognition improved 1.2 years, while reading comprehension improved 1.7 years, and word attack skills improved 1.2 years), spelling (the ETLC students made 1.4 years growth), and arithmetic (students made .5 years growth). Enrollment and testing statistics are provided. (MB)

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THIRD ANNUAL REPORT

1977-1978

EDUCATIONAL TESTING AND LEARNING CLINIC

YEAR-END STATISTICAL REPORT

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1977-1978

YEAR-END STATISTICAL REPORT

The year-end statistical report will be discussed via two general areas:

I. Characteristics of students participating in the ETLC for the 1977-1978 school year.

II. Academic progress made by ETLC students.

The first part of the report will discuss the type of skills, abilities and disabilities most typical of students who participated in the ETLC program for the 1977-1978 school year. This information will have important implications for the type of remedial programs established because of the close connection between student characteristics and programs. The second part of the report will examine the effectiveness of the current programs in remediating the various academic skill deficits of ETLC students. This will be accomplished through an analysis of the type of academic gains made by ETLC students.

I.

CHARACTERISTICS OF STUDENTS PARTICIPATING IN THE ETLC FOR THE 1977-1978 SCHOOL YEAR

INTELLIGENCE

The mean full IQ on the Wechsler Adult Intelligence Scale (W.A.I.S.) for ETLC students was 93.08. Although this score was about 7 points below

the norm, it was within normal limits. It is noteworthy that the ETLC group as a whole displayed relatively normal intellectual functioning even though academically they demonstrated serious deficits. As would be expected with a learning disabled group, their mean verbal scale (89.78) was well below their performance scale (97.81). These data are presented in Table A and shown in Figure 1.

TABLE A

MEANS AND STANDARD DEVIATIONS OF INTELLIGENCE QUOTIENTS FOR ETLC STUDENTS ON THE WECHSLER ADULT INTELLIGENCE SCALE

VARIABLE MEASURED	N	MEAN	STANDARD DEVIATION
Verbal Scale	107	89.78	9.95
Performance Scale	105	97.81	13.11
Full Scale	106	93.08	10.51

ACADEMIC FUNCTIONING

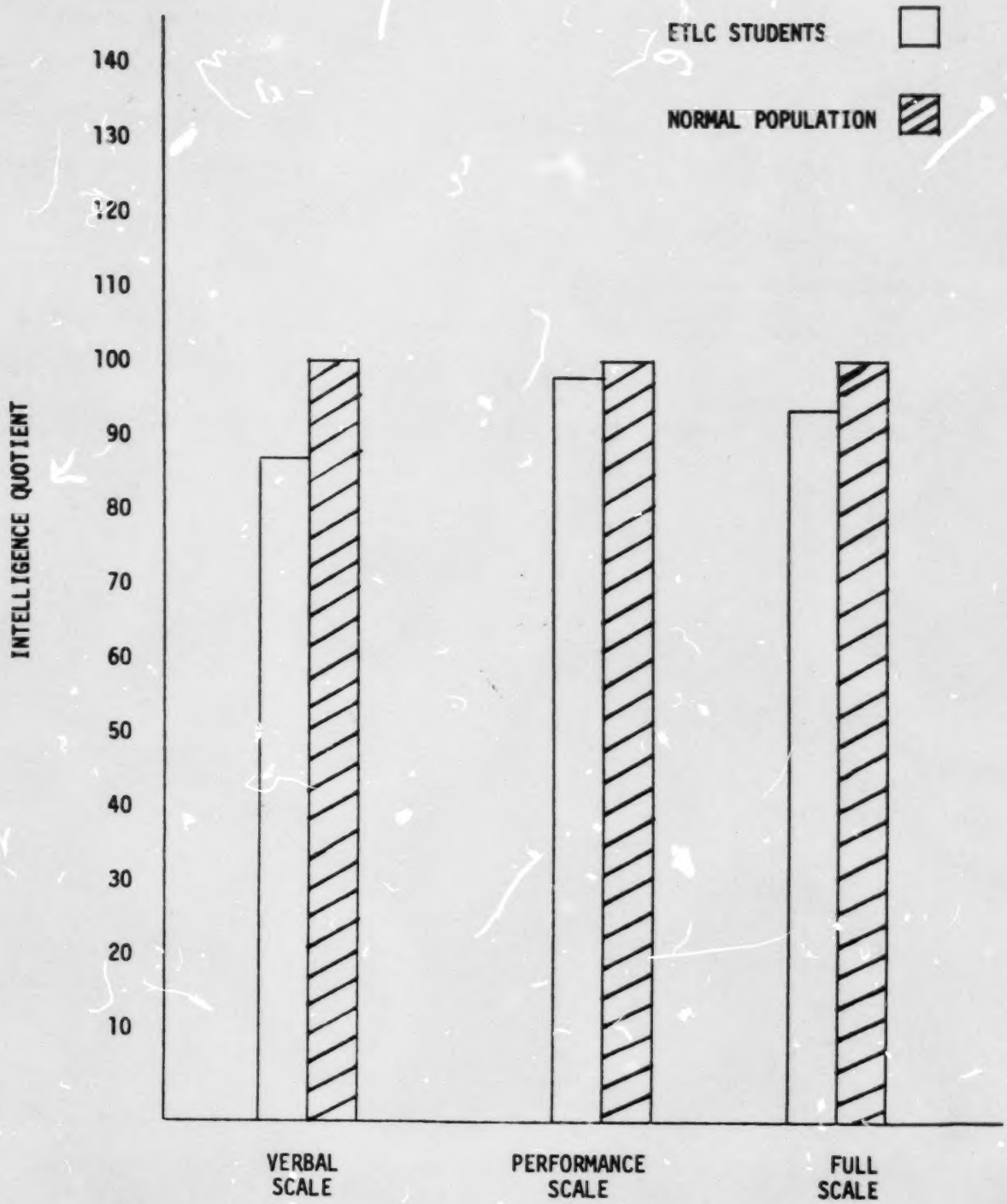
Reading

The reading area was assessed by the following instruments:

(1) Peabody Individual Achievement Tests (P.I.A.T.) - Reading Recognition Subtest.

(2) Peabody Individual Achievement (P.I.A.T.) - Reading Comprehension Subtest.

FIGURE 1. MEAN INTELLIGENCE QUOTIENTS OF ETLC STUDENTS ON THE WECHSLER ADULT INTELLIGENCE SCALE



According to the P.I.A.T. reading results, the typical ETLC student appears to be reading between a middle fifth and low sixth grade level. These data are presented in Table B and Figure 2. Taken as a whole, these scores would suggest that the average ETLC student is "functionally" literate in terms of reading. That is, he/she should be able to read most material produced for public consumption (e.g., newspaper). However, it should be noted that the standard deviations for these test results are rather large and indicate that there are a large number of ETLC students reading well below a fifth grade level. Also, having a high fifth grade reading level would greatly handicap students in surviving in most community college classes. Certainly most college textbooks are written above a high elementary school level.

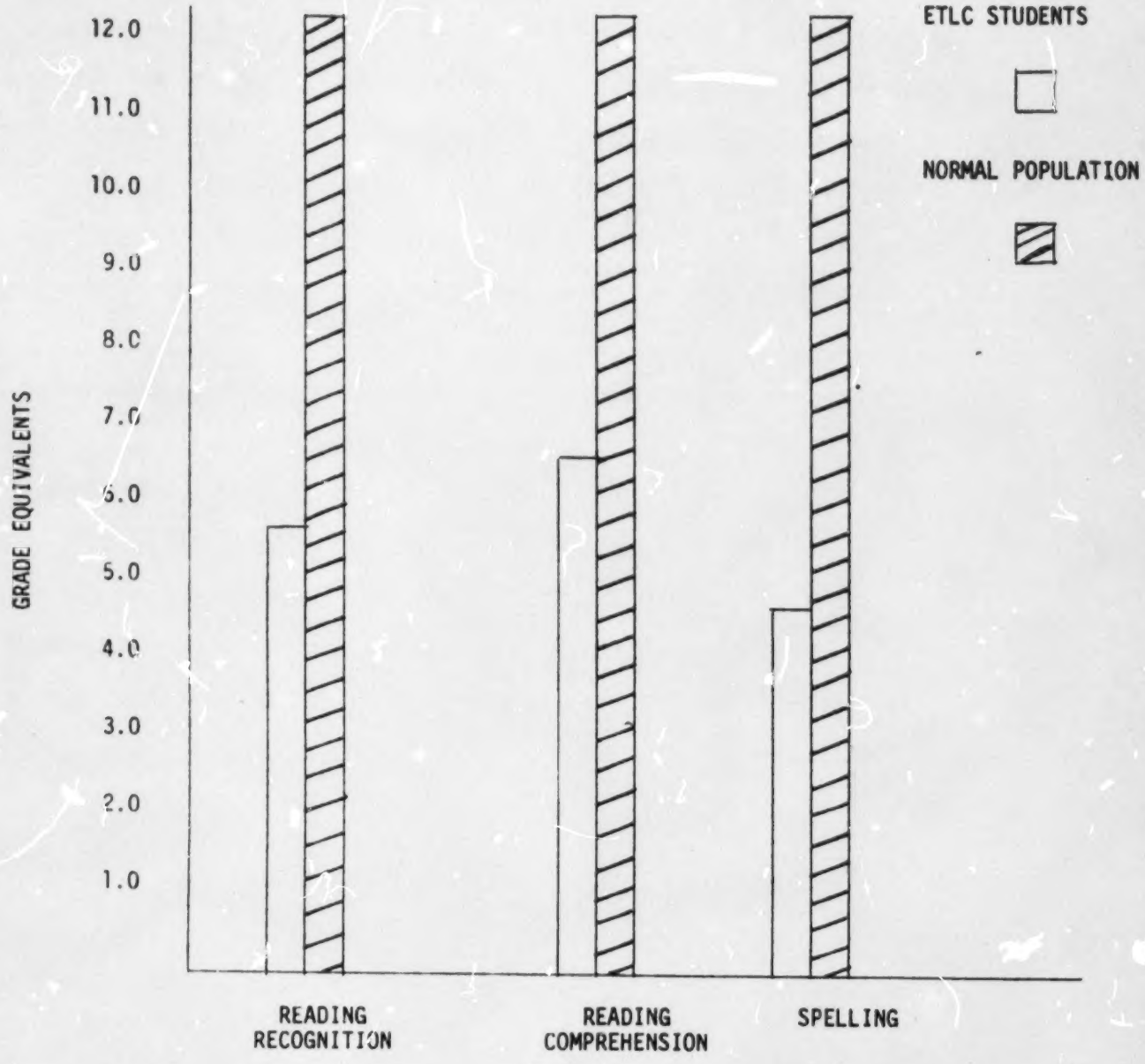
TABLE B

MEANS AND STANDARD DEVIATIONS OF RAW SCORES AND GRADE EQUIVALENTS FOR ETLC STUDENTS ON THE PEABODY INDIVIDUAL ACHIEVEMENT TESTS

(GRADE EQUIVALENTS)

VARIABLE MEASURED	N	MEAN	STANDARD DEVIATION
Reading Recognition	116	46.37 (5.4)	15.09
Reading Comprehension	116	48.33 (6.2)	13.45
Spelling	116	43.40 (4.4)	12.02

FIGURE 2. MEAN GRADE LEVELS FOR ETLC STUDENTS ON THE PEABODY INDIVIDUAL ACHIEVEMENT TESTS.



Spelling

The spelling area was assessed by the P.I.A.T. Spelling subtest. On the P.I.A.T. the mean spelling grade equivalent was 4.4. This data is presented in Table B and Figure 2. The academic implications for this level of functioning would appear to be obvious. That is, students with spelling/writing skills at a low fourth grade level would not be able to function adequately in classes requiring minimum writing skills. This would include a large proportion of the community college general education courses.

Arithmetic

The arithmetic area was assessed by the following instruments:

(1) Key Math Diagnostic Arithmetic Test.

(2) Wide Range Achievement Test (W.R.A.T.) - Arithmetic Subtest.

On the Key Math and W.R.A.T. (i.e., tests dependent on computational skills), the mean performance of ETLC students was at about a middle fifth grade level. These data are presented in Tables C and D and shown in Figures 3 and 4.

TABLE C

MEANS AND STANDARD DEVIATIONS OF RAW SCORES AND GRADE EQUIVALENTS FOR ETLC STUDENTS ON THE KEY MATH DIAGNOSTIC ARITHMETIC TEST

(GRADE EQUIVALENT)

VARIABLE MEASURED	N	MEAN	STANDARD DEVIATION
Total Arithmetic	19	151.52 (5.4)	27.60

TABLE D

MEANS AND STANDARD DEVIATION OF RAW SCORES AND GRADE EQUIVALENT FOR ETLC STUDENTS ON THE WIDE RANGE ACHIEVEMENT SUBTEST

(GRADE EQUIVALENT)

VARIABLE MEASURED	N	MEAN	STANDARD DEVIATION
Arithmetic	71	37.07 (5.5)	9.65

It is interesting to note that this level of computational skill is below the minimum standards required to take the lowest remedial math course at Orange Coast College (Mathematics 005).

AUDITORY PROCESSING

The area of auditory processing was measured by the following instruments:

(1) Goldman-Fristoe-Woodcock (G-F-W) Sound-Symbol Tests:

- (a) Sound Mimicry Subtest
- (b) Sound Recognition Subtest
- (c) Sound Analysis Subtest
- (d) Sound Blending Subtest
- (e) Sound-Symbol Association Subtest
- (f) Reading of Symbols Subtest
- (g) Spelling of Sounds Subtest

(2) Goldman-Fristoe-Woodcock Selective Attention Test.

FIGURE 3. MEAN GRADE LEVELS FOR ETLC STUDENTS ON THE KEY MATH DIAGNOSTIC ARITHMETIC TEST

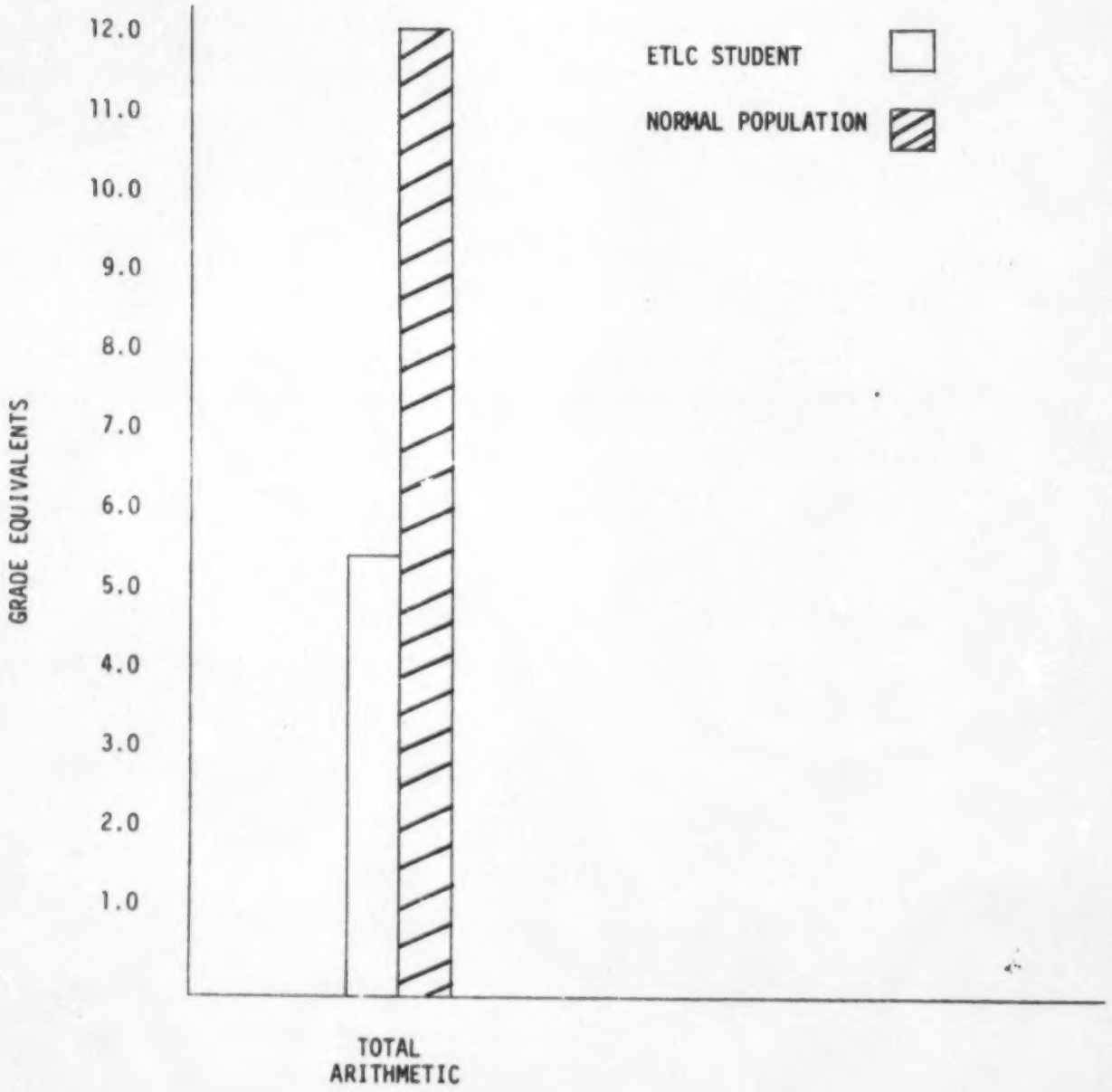
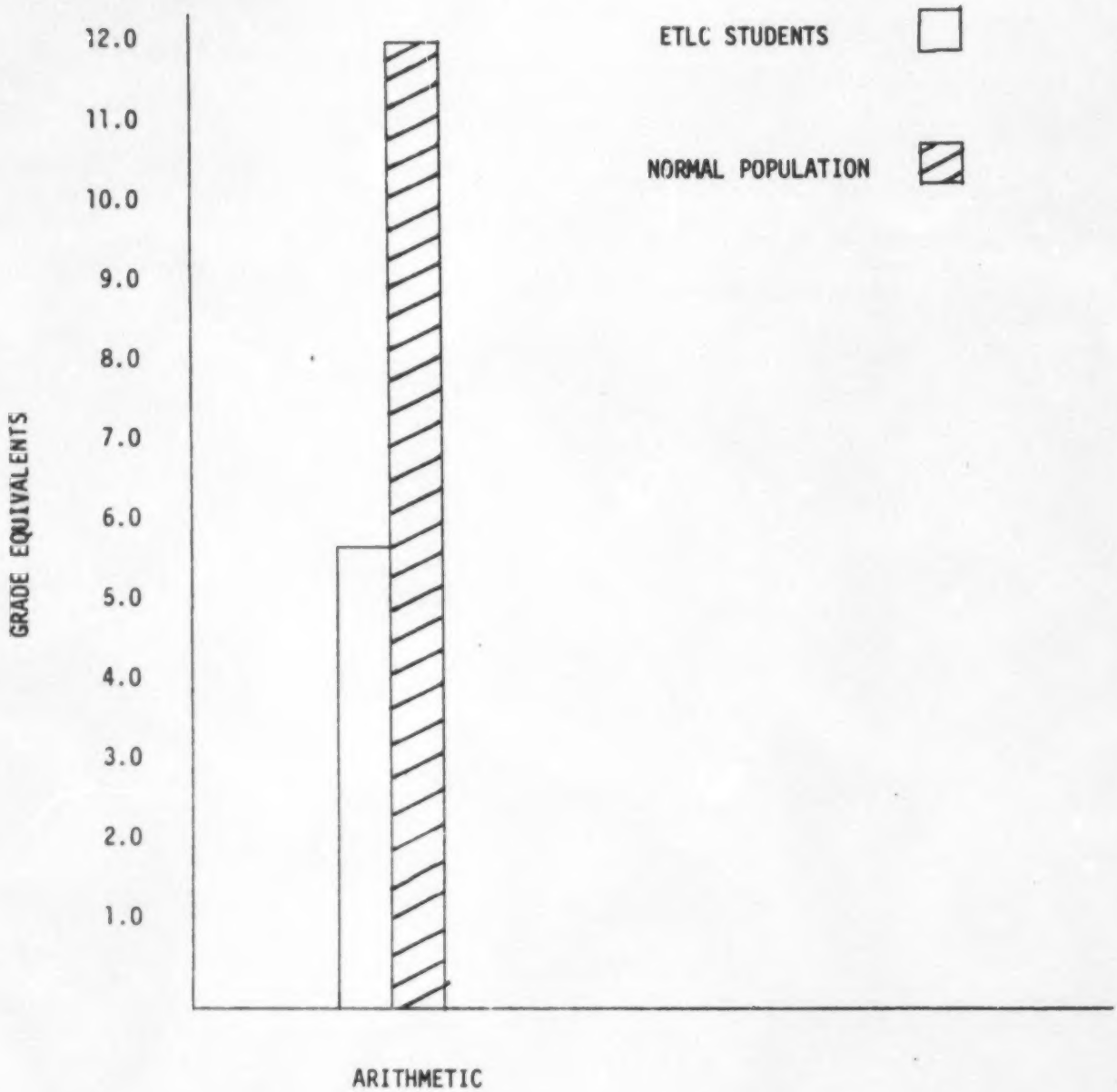


FIGURE 4. MEAN GRADE LEVELS FOR ETLC STUDENTS ON THE WIDE RANGE ACHIEVEMENT TEST.



On the GFW Sound-Symbol Tests, which primarily measure auditory reception skills that are prerequisite for reading and spelling, the mean scores ranged from the fourth percentile to the eighteenth percentile. On the GFW Selective Attention Test, which assesses a person's ability to receive and attend to auditory information under difficult conditions, the mean score for ETLC students was at the twenty-fifth percentile. These data may be found in Table E and Figure 5.

There can be no question that these exceptionally low auditory skill (processing) levels go a long way in explaining the serious academic deficits found for ETLC students in the reading, spelling and arithmetic areas.

AUDITORY MEMORY

The area of auditory memory was measured by the following instruments:

(1) GFW Auditory Memory Tests
    (a) Recognition Memory
    (b) Memory for Content
    (c) Memory for Sequence
(2) Detroit Tests of Learning Aptitude (D.T.L.A.)
    (a) Auditory Attention - Unrelated Syllables Subtest
    (b) Auditory Attention - Related Syllables Subtest
    (c) Oral Directions Subtest

Both sets of subtests on the GFW and the D.T.L.A. are measures of short term auditory memory dealing with meaningful and non-meaningful material.

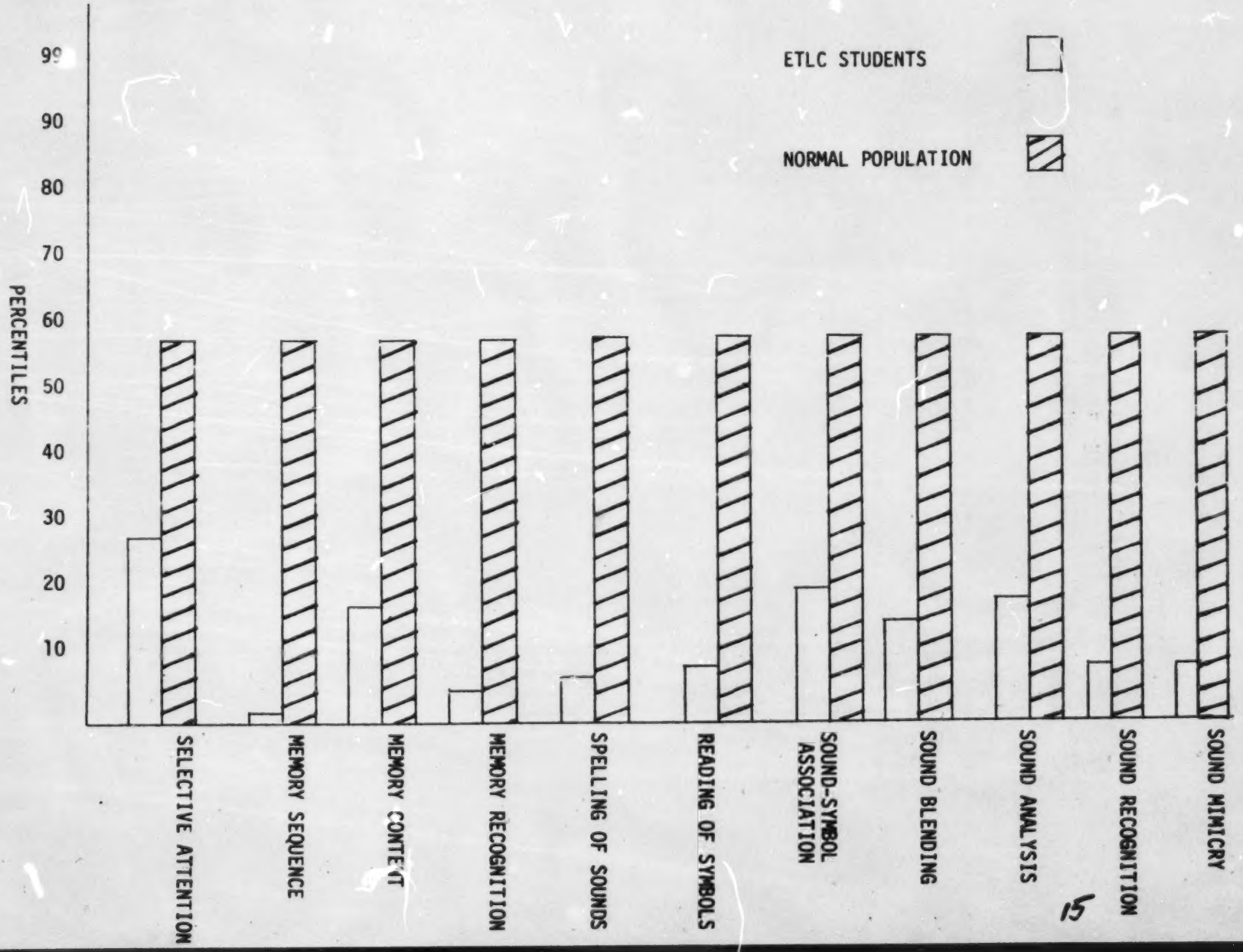
TABLE E

MEANS AND STANDARD DEVIATIONS OF RAW SCORES AND PERCENTILES FOR ETLC STUDENTS ON THE GOLDMAN-FRISTOE-WOODCOCK AUDITORY SKILLS TEST BATTERY

(PERCENTILES)

VARIABLE MEASURED	N	MEAN	STANDARD DEVIATION
Memory - Recognition	103	100.81 (3)	11.17
Memory - Content	103	23.08 (13)	8.74
Memory - Sequence	100	49.46 (1)	11.10
Sound Mimicry	100	46.03 (8)	9.65
Sound Recognition	100	27.92 (8)	2.58
Sound Analysis	100	22.41 (12)	7.15
Sound Blending	99	14.05 (11)	8.21
Sound-Symbol Association	102	32.67 (18)	9.83
Reading of Symbols	108	30.10 (6)	18.24
Spelling of Sounds	100	14.65 (4)	11.77
Selective Attention	98	102.47 (25)	4.51

FIGURE 5. MEAN PERCENTILES FOR ETLC STUDENTS ON THE GOLDMAN-FRISTOE-WOODCOCK AUDITORY SKILLS TEST BATTERY



A review of the GFW Auditory Memory Tests and the D.T.L.A. subtests clearly points out the seriousness of the auditory memory deficits that are characteristic of the typical ETLC student. The percentiles for the GFW Memory Tests ranged from one to thirteen. The age equivalent scores on the three above mentioned auditory memory tests of the D.T.L.A. ranged from 7-6 to 10-9. These data are presented in Tables E, F and graphically shown in Figures 5, 6.

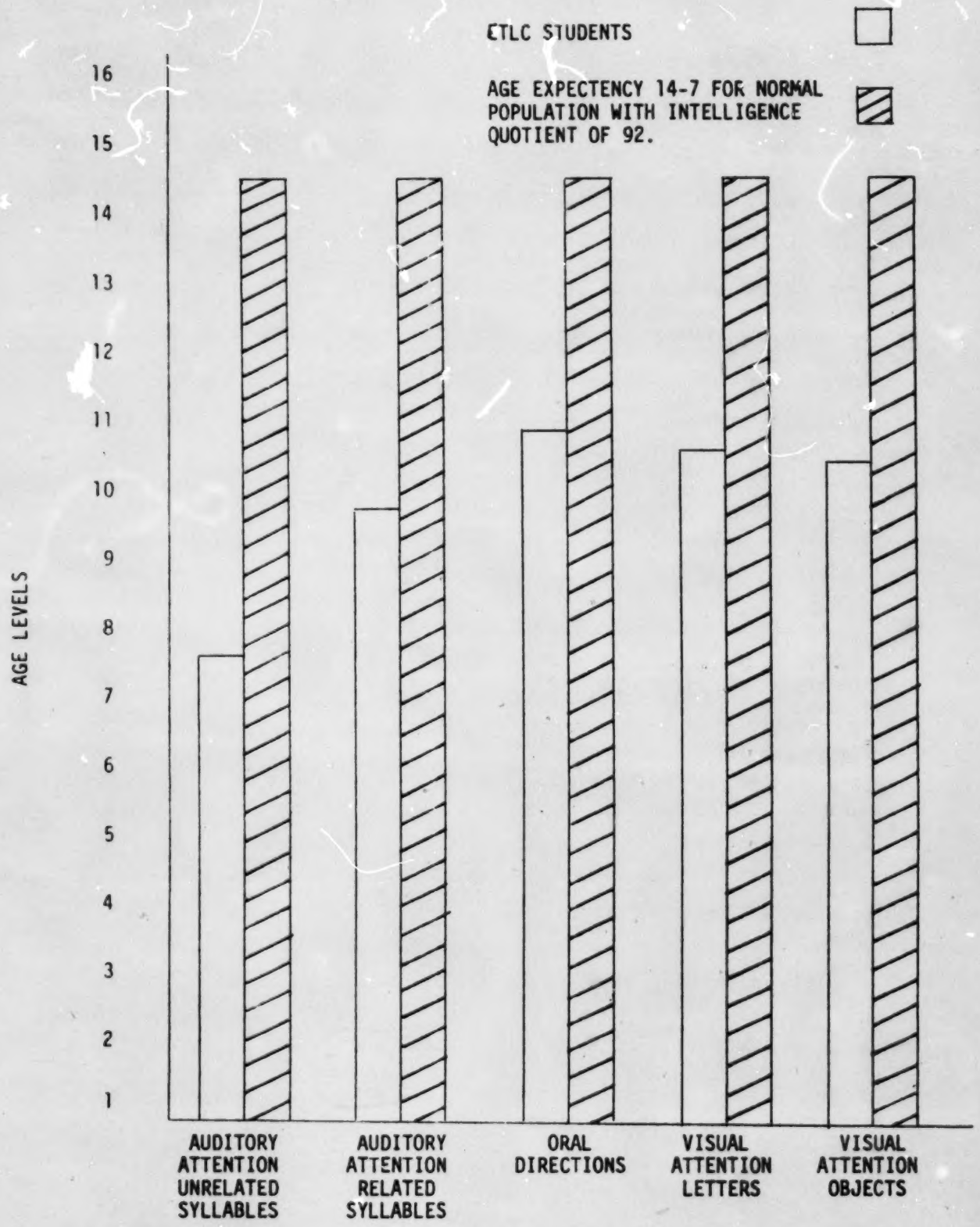
TABLE F

MEANS AND STANDARD DEVIATIONS OF RAW SCORES AND AGE EQUIVALENTS FOR ETLC STUDENTS ON THE DETROIT TESTS OF LEARNING APTITUDE

(AGE EQUIVALENTS)

VARIABLE MEASURED	N	MEAN	STANDARD DEVIATION
Auditory Attention - Unrelated Syllables	94	42.19 (7-6)	7.99
Auditory Attention - Related Syllables	117	67.22 (9-9)	18.47
Oral Directions	115	9.63 (10-9)	5.75
Visual Attention - Letters	116	126.30 (10-5)	20.70
Visual Attention - Objects	114	46.94 (10-6)	6.44

FIGURE 6. MEAN AGE LEVELS FOR ETLC STUDENTS ON THE DETROIT TESTS OF LEARNING APTITUDE



The severity of the deficits in the area of auditory memory would appear to have serious implications for most academic settings. For example, poor auditory memory would, most likely, prevent a student from profiting from oral instruction (e.g., lecture material) and acquiring basic skills in reading, spelling and arithmetic.

VISUAL MEMORY

The visual memory area was assessed by the following tests:

(1) D.T.L.A.

(a) Visual Attention - Letters Subtest.

(b) Visual Attention - Objects Subtest.

The Visual Attention subtests of the D.T.L.A., which measure short term visual memory, indicated that the average ETLC student is somewhat lacking in terms of visual memory. These data are contained in Table F and Figure 6. It is noteworthy that the mean age equivalents of 10-6 and 10-5 do not appear to be as functionally debilitating as the auditory memory deficits. That is, the ten year operating level seems to be high enough for most of the students to function at a minimally adequate level in a classroom setting. It is interesting to note that when comparing the ETLC students' auditory and visual abilities, it would seem that many of the students may be "visual learners." This would have serious implications for the type of remediation material used in the clinic. For example, the majority of the programs employ a large amount of visual aides.

SUMMARY

Looking at ETLC students as a whole it would appear that certain common characteristics seem to emerge. For instance, the "typical" ETLC student is of low average IQ and has reading, spelling and arithmetic skills equivalent to the average student in the upper elementary grades. Furthermore, he/she has severe auditory processing and memory problems that are no doubt related to his/her academic deficits. It should be noted, however, that the relatively large standard deviations for much of the data suggest that the term "typical" may be somewhat misleading. The implications, then, for individualized remedial programs would seem to be apparent.

II.

ACADEMIC PROGRESS MADE BY ETLC STUDENTS

A pre-post experimental group only design was used to assess the academic gains made by ETLC students. It should initially be noted that the time period between pre and post measures varied among many of the ETLC students. The primary reason for this variation was the "open-entry", "open-exit" policy of the learning clinic. That is, students may enter or leave the program at any time during a semester. In regard to the period of time between pre and post testing, the average time was about five instructional months. The standard deviation of this time period was approximately two months, indicating a sizable amount of variability in the amount of time students were in the program. It should also be mentioned that in terms of actual amount of instructional time, the typical ETLC student received slightly over five hours of remediation per week.

The basic goal of this section is to determine if ETLC students made significant academic gains. The data was analyzed by separately examining each academic area (i.e., reading, spelling and arithmetic). A "t" test for dependent samples was applied to all of the data.

READING

A review of Table G and Figure 7 indicates that in the area of word recognition (P.I.A.T. Reading) ETLC students made statistically significant gains ($p. > .01$) over the pre-post period.

TABLE G

MEANS AND "t" VALUES OF RAW SCORES AND GRADE EQUIVALENTS FOR THE PEABODY INDIVIDUAL ACHIEVEMENT TESTS FOR PRE AND POST MEASURES FOR ETLC STUDENTS

(GRADE EQUIVALENTS)

VARIABLE MEASURED	N	PRE-TEST	POST-TEST	GAIN	"t" VALUE	INSTRUCTIONAL MONTHS	
		MEAN	MEAN	MEAN		MEAN	STANDARD DEVIATION
Reading Recognition	64	(5.2) 44.73	(6.4) 50.90	(1.2) 6.17	-2.82**	4.93	2.25
Reading Comprehension	60	(5.8) 45.80	(7.5) 51.98	(1.7) 6.18	-7.95***	5.00	2.28
Spelling	61	(4.2) 41.82	(5.6) 46.70	(1.4) 4.88	-5.38***	5.04	2.31

*p. > .05
**p. > .01
***p. > .001

For an average of five instructional months, the ETLC group's word recognition improved 1.2 years. This gain appears to be noteworthy in light of the fact that a large number of these students had been in special education for many years without academically progressing. Also, because of the nature of this population and the severity of their disabilities, a gain of 1.2 years in five months is most encouraging since the students were making two and one-half months growth for each month in the program.

The area of reading comprehension was measured by the P.I.A.T. Reading Comprehension subtest. The data for this area appears in Table G and Figure 8.

FIGURE 7. MEAN GRADE EQUIVALENT GAINS BETWEEN PRE AND POST MEASURES ON THE PEABODY INDIVIDUAL ACHIEVEMENT TEST FOR ETLC STUDENTS ON READING RECOGNITION

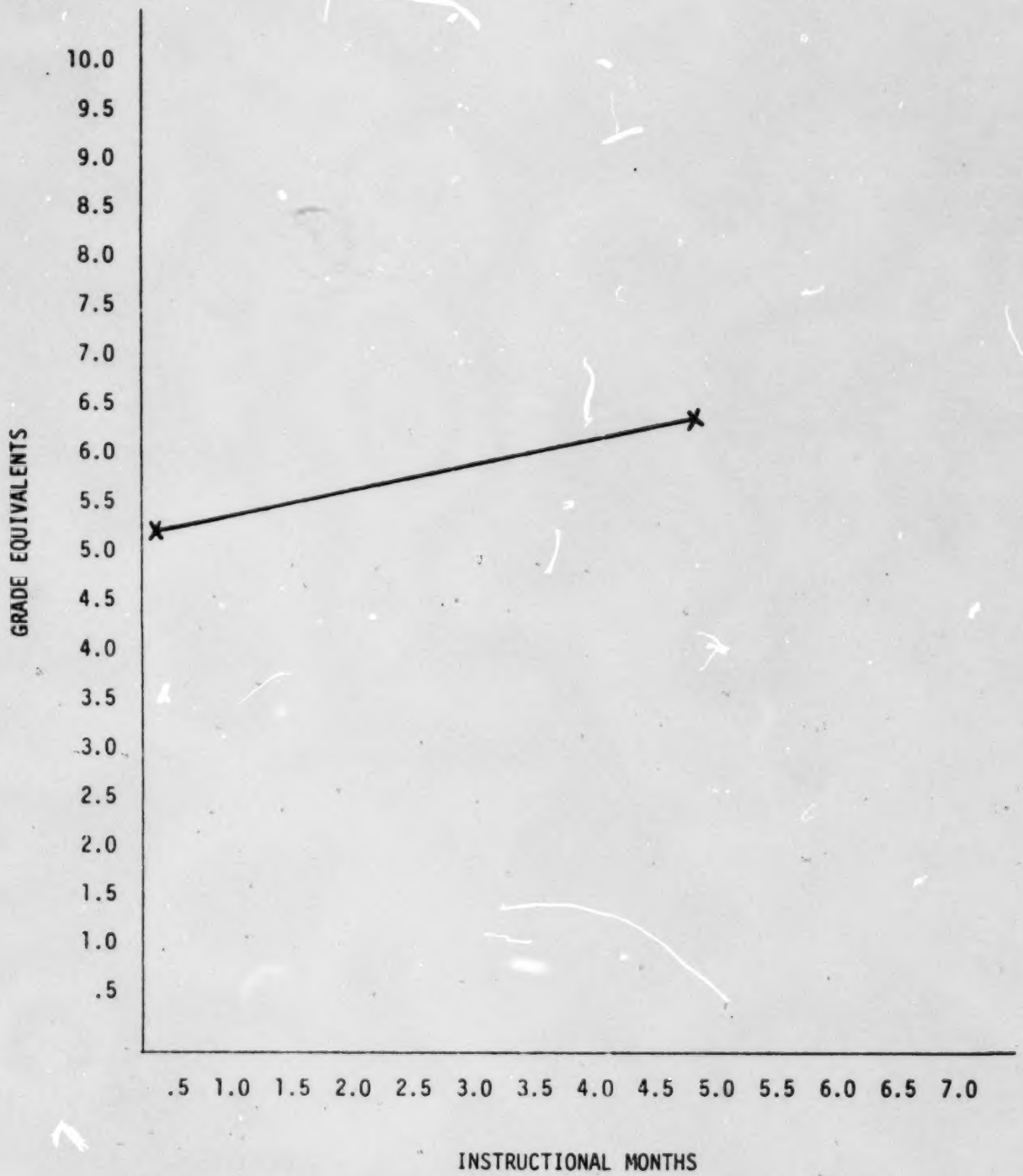
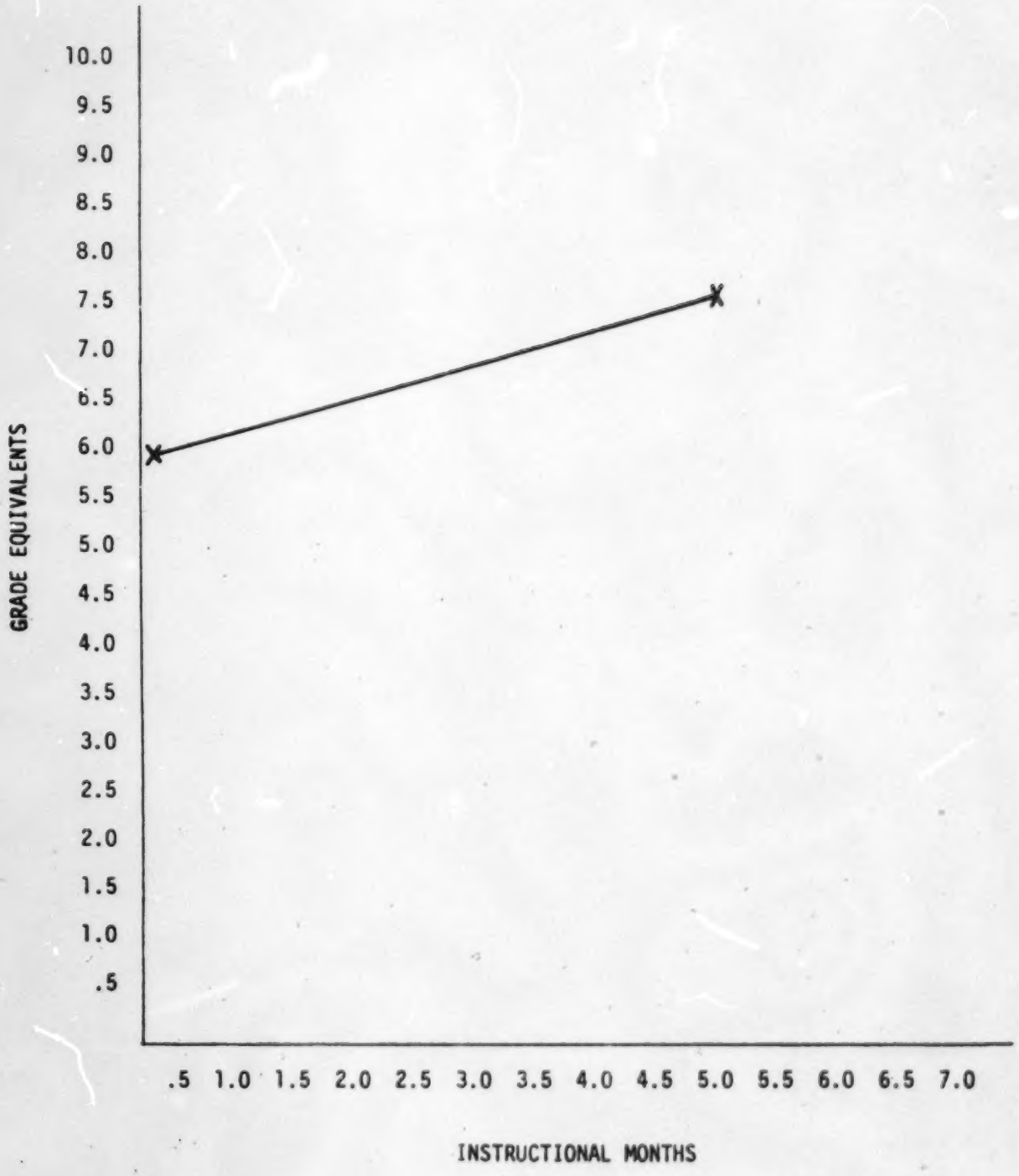


FIGURE 8. MEAN GRADE EQUIVALENT GAINS BETWEEN PRE AND POST MEASURES ON THE PEABODY INDIVIDUAL ACHIEVEMENT TEST FOR ETLC STUDENTS ON READING COMPREHENSION



For the five-month pre-post interim period, the mean gain for ETLC students was 1.7 years. This gain was statistically highly significant (p. > .001).

Another area related to reading that was measured was that of "phonetic word attack skills". This was measured by the Goldman-Fristoe-Woodcock Reading of Symbols subtest. The pre-post gains made in this area are presented in Table H and graphically shown in Figure 9. It is very noteworthy that the 1.2 years gain made on the Reading of Symbols subtest was identical to the 1.2 years gain made in the area of word recognition (P.I.A.T.). In other words, the remedial work done on student's phonetic word attack skills appears to have a direct carry-over effect on reading recognition skills.

TABLE H

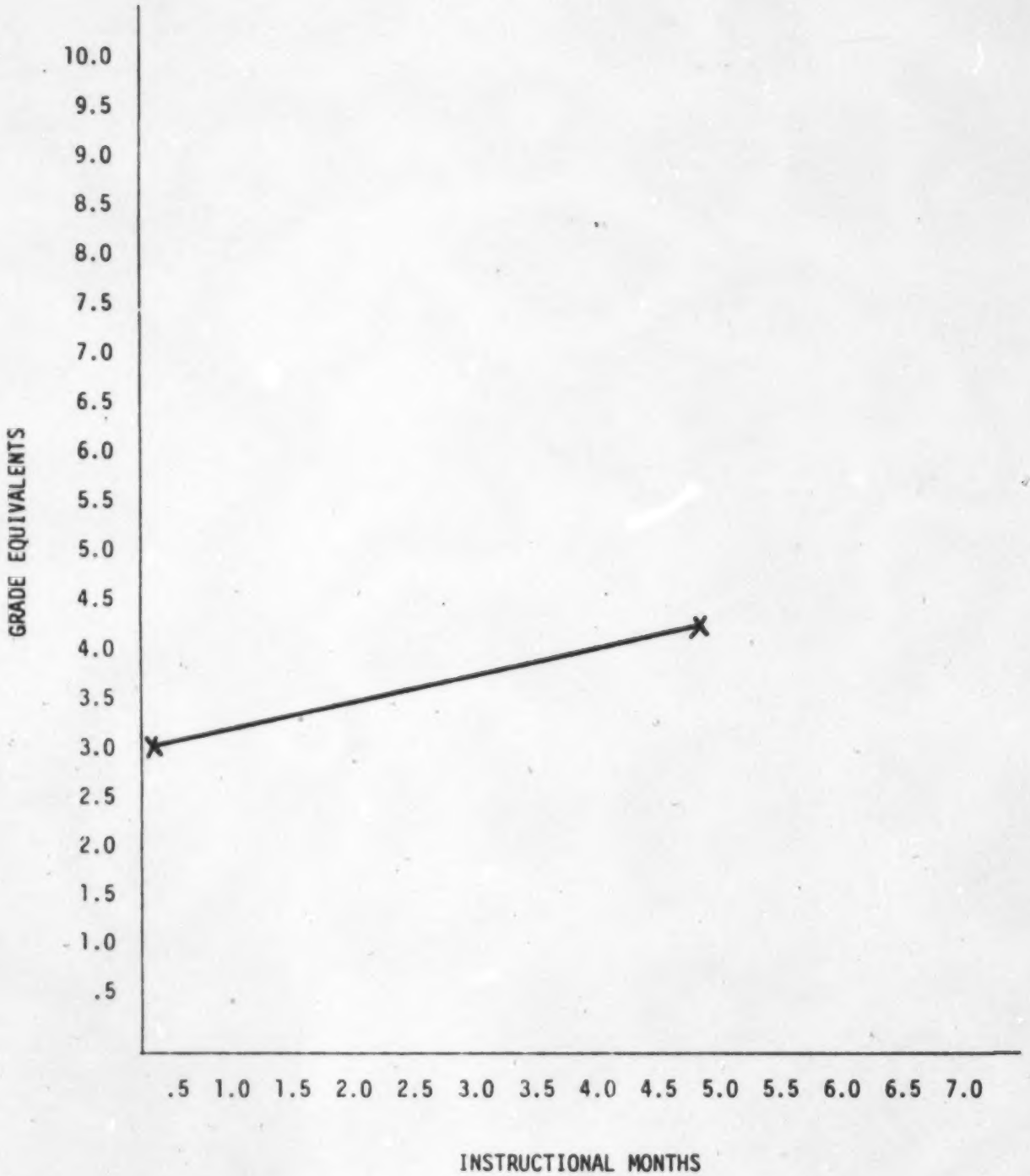
MEANS AND "t" VALUES OF RAW SCORES AND GRADE EQUIVALENTS FOR THE GOLDMAN-FRISTOE-WOODCOCK READING OF SYMBOLS SUBTEST FOR PRE AND POST MEASURES FOR ETLC STUDENTS

(GRADE EQUIVALENTS)

VARIABLE MEASURED	N	PRE-TEST MEAN	POST-TEST MEAN	GAIN MEAN	"t" VALUE	INSTRUCTIONAL MONTHS MEAN	INSTRUCTIONAL MONTHS STANDARD DEVIATION
Reading of Symbols	48	(3.0) 26.46	(4.2) 39.94	(1.2) 13.48	*** -5.13	4.96	2.38

* p > .05
** p > .01
*** p > .001

FIGURE 9. MEAN GRADE EQUIVALENT GAINS BETWEEN PRE AND POST MEASURES ON THE GOLDMAN-FRISTOE-WOODCOCK'S READING OF SYMBOLS SUBTEST FOR ETLC STUDENTS



SPELLING

The area of spelling was measured by the P.I.A.T. Spelling subtest. An examination of Table G and Figure 10 reveals that for the five months of remedial instruction, ETLC students made 1.4 years growth.

The 1.4 years gain on the P.I.A.T. was statistically significant beyond the .001 level of confidence. The gains made in spelling appear to be commensurate with those made in the reading area. This is to be expected as approximately the same amount of remedial time was devoted to both areas.

Another area related to spelling that was measured was that of the student's ability to apply phonetic rules to spelling. This was measured by the Goldman-Fristoe-Woodcock's Spelling of Sounds subtest. The pre-post gains are presented in Table I and graphically shown in Figure 11. The gains made in this area were statistically significant beyond the .001 level of confidence. These gains certainly underscore the emphasis that the ETLC remedial program places on developing phonetic skills.

TABLE I

MEANS AND "t" VALUES OF RAW SCORES AND PERCENTILES FOR THE GOLDMAN-FRISTOE-WOODCOCK'S SPELLING OF SOUNDS SUBTEST FOR PRE AND POST MEASURES FOR ETLC STUDENTS

(PERCENTILES)

VARIABLE MEASURED	N	PRE-TEST MEAN	POST-TEST MEAN	MEAN GAIN	"t" VALUE	INSTRUCTIONAL MONTHS MEAN	INSTRUCTIONAL MONTHS STANDARD DEVIATION
Spelling of Sounds	49	(3) 12.47	(8) 20.02	(5) 7.55	*** -7.03	5.12	2.35

* p > .05
** p > .01
*** p > .001

FIGURE 10. MEAN GRADE EQUIVALENT GAINS BETWEEN PRE AND POST MEASURES ON THE PEABODY INDIVIDUAL ACHIEVEMENT TEST FOR ETLC STUDENTS ON SPELLING

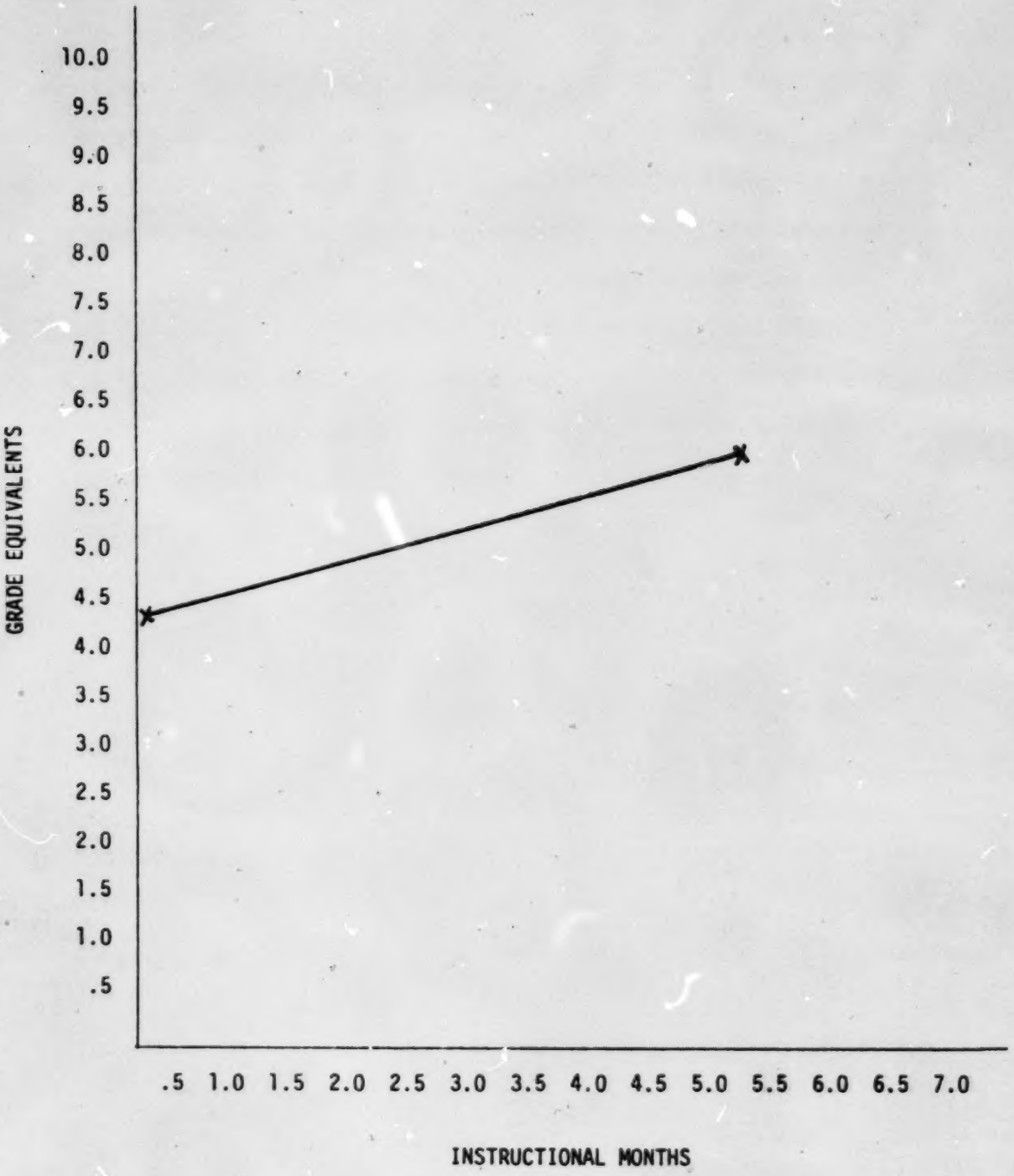
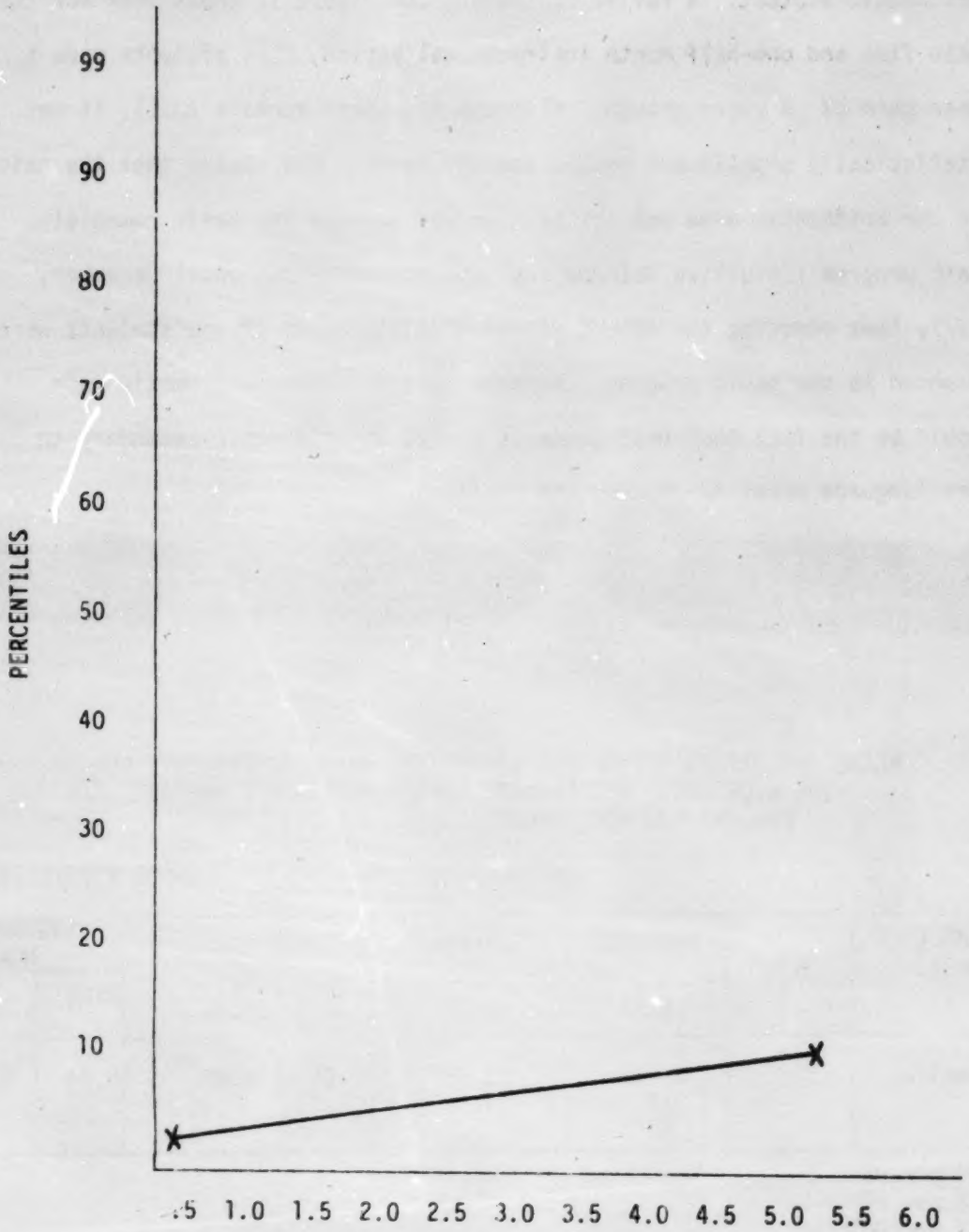


FIGURE 11. MEAN PERCENTILE GAINS BETWEEN PRE AND POST MEASURES ON THE GOLDMAN-FRISTOE-WOODCOCK'S SPELLING OF SOUNDS SUBTEST FOR ETLC STUDENTS



ARITHMETIC

The arithmetic area was assessed by the Wide Range Achievement Arithmetic subtest. A review of Table J and Figure 12 shows that for the mean five and one-half month instructional period, ETLC students made a mean gain of .5 years growth. Although this gain appears small, it was statistically significant beyond the .01 level. One reasons that the gain in the arimetic area was not greater was because the basic remedial math program (Intuitive Mathematics) was not initiated until December, 1977, thus reducing the amount of remedial time many of the students were exposed to the basic program. Another reason for the arithmetic gain would be the fact that most students worked on arithmetic secondary to the language areas of reading and spelling .

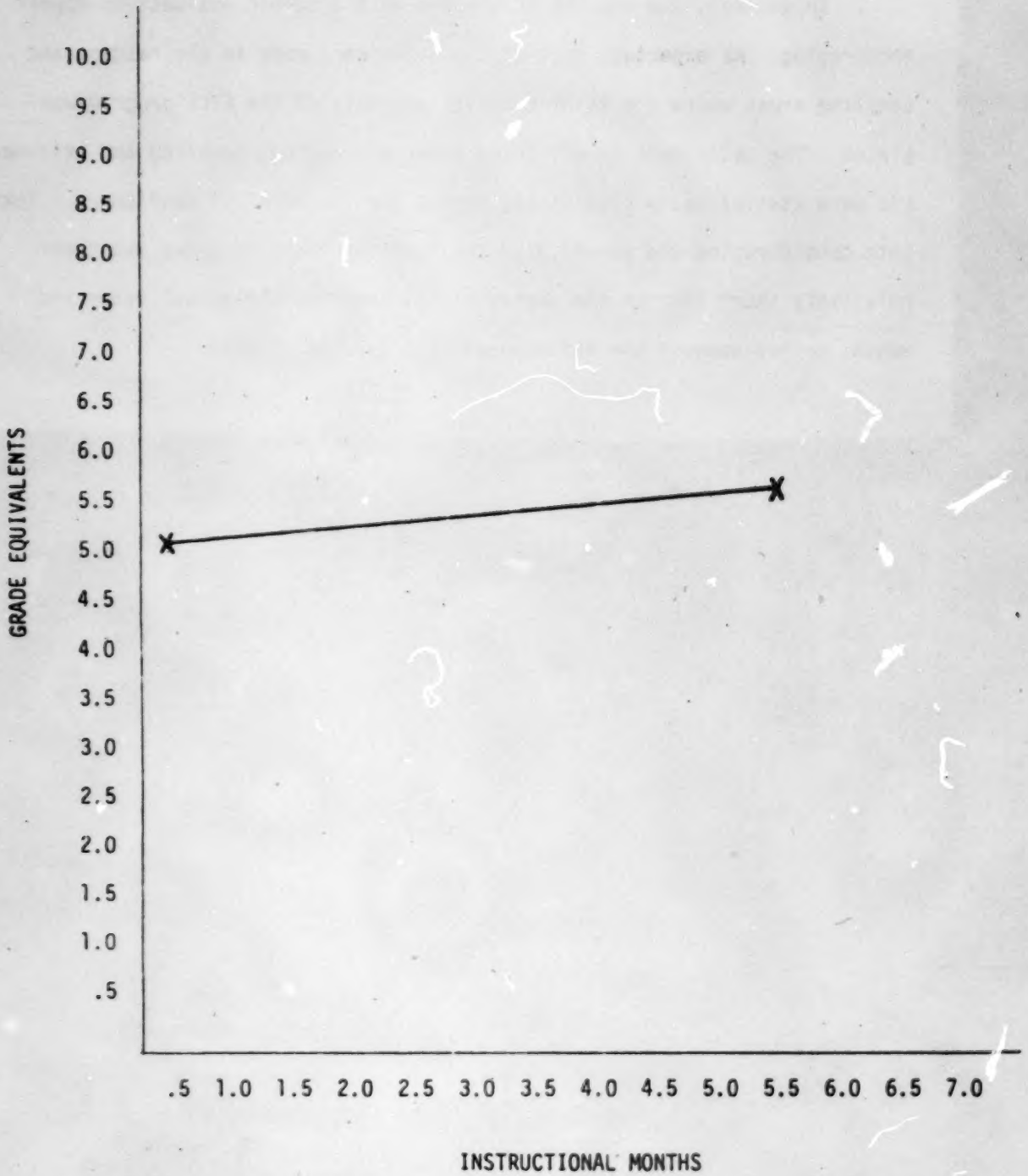
TABLE J

MEANS AND "t" VALUES OF RAW SCORES AND GRADE EQUIVALENTS FOR THE WIDE RANGE ACHIEVEMENT TEST'S ARITHMETIC SUBTEST FOR PRE AND POST MEASURES FOR ETLC STUDENTS (GRADE EQUIVALENTS)

VARIABLE MEASURED	N	PRE-TEST MEAN	POST-TEST MEAN	MEAN GAIN	"t" VALUE	INSTRUCTIONAL MONTHS MEAN	INSTRUCTIONAL MONTHS STANDARD DEVIATION
Arithmetic	17	33.76 (5.0)	36.71 (5.5)	3.05 (.5)	3.01**	5.44	2.66

* p .05
** p .01
*** p .001

FIGURE 12. MEAN GRADE EQUIVALENT GAINS BETWEEN PRE AND POST MEASURES ON THE WIDE RANGE ACHIEVEMENT ARITHMETIC SUBTEST FOR ETLC STUDENTS



SUMMARY

In general, the results of the pre-post academic evaluation appear encouraging. As expected, most of the gains were made in the reading and spelling areas where the major remedial emphasis of the ETLC program was placed. The gains made in all three areas of reading, spelling and aritheme-tic were statistically significant beyond the .01 level of confidence. Taking into consideration the severity of the learning disabled group and their relatively short time in the instructional program, the actual years and months gained suggest the efficacy of this type of program.

ENROLLMENT STATISTICS (1977-1978)

1.0	Total number enrolled in ETLC	109
1.1	Enrollment time:	
	One semester	43
	Two semesters	34
	Three semesters	18
	Four semesters	6
	Five semesters	5
	Six semesters	3
1.2	Students dismissed from ETLC	62
	Achieved goal	26
	Lack of Progress	3
	Instructor initiated drop (Lack of attendance, etc.)	24
	Student initiated drop	9
1.3	Students recommended to continue	47
2.0	Total number of students tested by Psychologist	148
2.1	Student given brief testing but not brought to A & D	8
2.2	Students who qualified for ETLC	89
2.3	Students who did not qualify for ETLC	51
2.4	Students referred to other programs	134
2.5	Students referred to outside agencies	26
2.6	Students referred to on-campus programs	108
2.7	Students accepted into program to begin Fall, 1978	22
2.8	Students on waiting list to be tested in August	19

3.0 Instructional Time in Program (Minutes):

	MEAN	STANDARD DEVIATION
Reading Recognition	1738.28	1100.48
Reading Comprehension	2040.36	1693.24
Spelling	2261.13	1737.17
Arithmetic	2738.11	2798.29

4.0 Attendance:

Day Students	75
Evening Students	34

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